

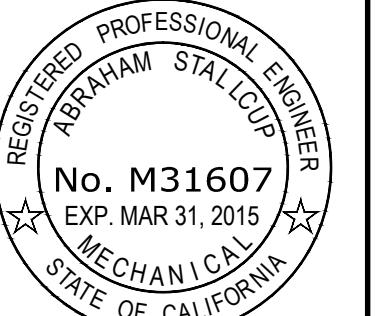
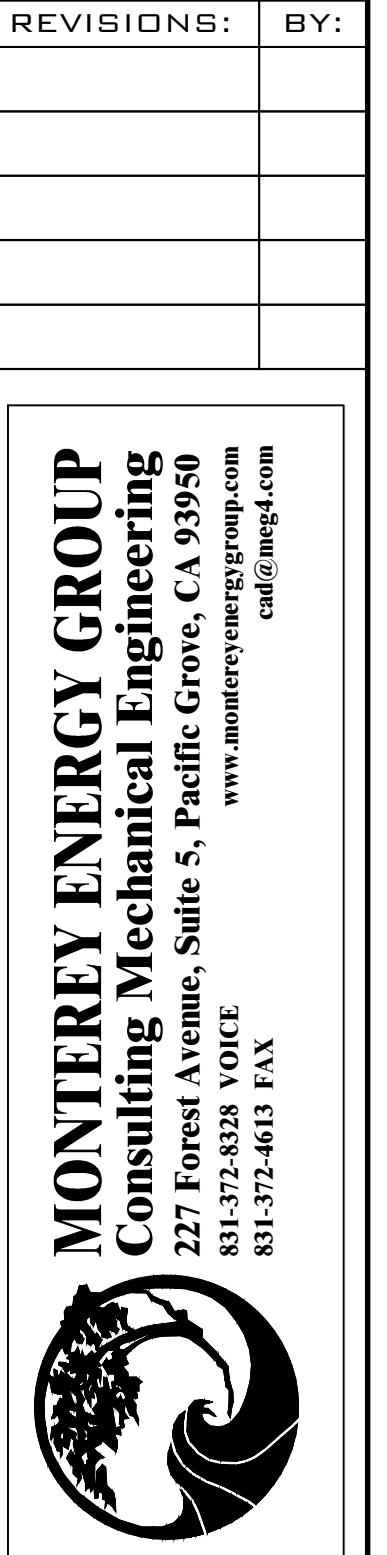
NOTES

GENERAL
 1. This drawing is conceptual and diagrammatic and does not constitute a complete plan. Installer to supply and install all materials shown on this plan and all others needed to complete this hydronic system. Also, provide any incidental work not shown or specified, which can be reasonable inferred as belonging to the work necessary to provide the complete system.
 2. Only qualified Plumbing or Heating technician shall install the heating system. Installer of Daiken Equipment shall have factory certification.
 3. Refer to all manufacturers guidelines pertaining to the installation, protection and maintenance of the heat source.

SUBSTITUTIONS
 4. Installer shall obtain authorization from the owner and design team for "Or Equal" substitutions on heating system components "Or equal" substitutions constitute components that are of equal quality and workmanship to those specified. Where possible components shall be of a single manufacturer and shall have approved ratings of all applicable agencies (UL, ASHRAE, ASME, etc.)

CONTROLS
 5. Outdoor reset, Boiler Pump, Domestic water pump and temperature control per Altherma and Daiken control systems. Refer to Elite and Altherma design manual.
 6. Control systems shall be complete, tested and fully operational prior to system balancing.
 7. Thermostats above are TekmarNet communicating thermostats. For other thermostats refer to manufacturer wiring instructions. Thermostats shall be programmable setback type. Low voltage hard wire with battery backup and min 7 day programmable, 4 time period function.
 8. Outdoor sensors should be placed in free air away from direct sunlight or other heat sources (preferably the north side of the building)
 9. Indoor sensors shall be placed at approximately the 5' level on an interior wall out of direct sunlight unless otherwise specified by the manufacturer.
 10. For exposed Thermostats 3-wire (common n) is not used.
 11. Ground Wires not shown for clarity. Ground all circuits per NEC and local code. Refer to manufacturers wiring guides.
 12. Teletests shall be 24 V-actuated compatible with approved manifolds. End switch valves (2 on 4 wire teletests typically not used, typ.
 13. All exposed wiring shall be protected in conduit per NEC.
 14. Sensors shall be placed in minimum 10 pipe diameter downstream of tees and mixing devices.

SEQUENCE OF OPERATION
Heating:
 15. The Daiken 3-way diverting valves shall normally divert water to the radiant heating circuit in the normally open position (de-energized).
 16. A call for heat from any thermostat to the P-1 ZVC zone controller shall open the matched zone actuator.
 17. The P-1 ZVC zone controller will energize the pump P-1 when there is a call for heat. P-1 delivers flow to the system based on temperature drop at sensors S1 and S2. P-1 shall be set to 15°F delta T temperature drop.
 18. The heating relay from the master ZVC zone control shall activate the Daiken heat pump in the heating mode. The Daiken pump energizes and heating water is injected into the radiant circuit.
 19. If the outdoor temperature drops below 55°F the bivalent mode of the HP-1 will automatically engage B-1 as a second stage of heating (HP-1 stops operating in this mode). B-1 injects heat into the radiant circuit per its outdoor reset control and E-1 boiler sequence control. See Elite controls installation manual for a detailed sequence of operation.
Cooling:
 20. If domestic hot water and heating has been satisfied, a call for cooling shall engage the Daiken 3-way diverting valve to divert water to the fan coil.
 21. A call for cooling from any thermostat to the Honeywell control shall open the matched zone damper and activate the fan at the fan coil.
 22. The cooling relay from the Honeywell control shall H-1 in the cooling mode. The Daiken pump energizes and cooling water is delivered to the fan coil.
 23. A normally closed relay shall open, disengaging the fan, when there is a call for radiant heating or domestic water heating priority to ensure the fan does not run during such periods.
Domestic Water Heating:
 24. A call for domestic water heating at the domestic water storage tank (IDWH-1) shall cause the Daiken control to energize the 3-way valve to divert heating water to the domestic water storage tank (IDWH-1).
 25. If the tank is full, disengaging the fan, when there is a call for domestic water heating priority to ensure the fan does not run during a call for heating or cooling.
 26. If the temperature of the tank falls below 100°F (boiler control well), B-1 shall heat the tank to set point per the Elite sequence of operation. Set point shall be 125°F with 25°F differential.

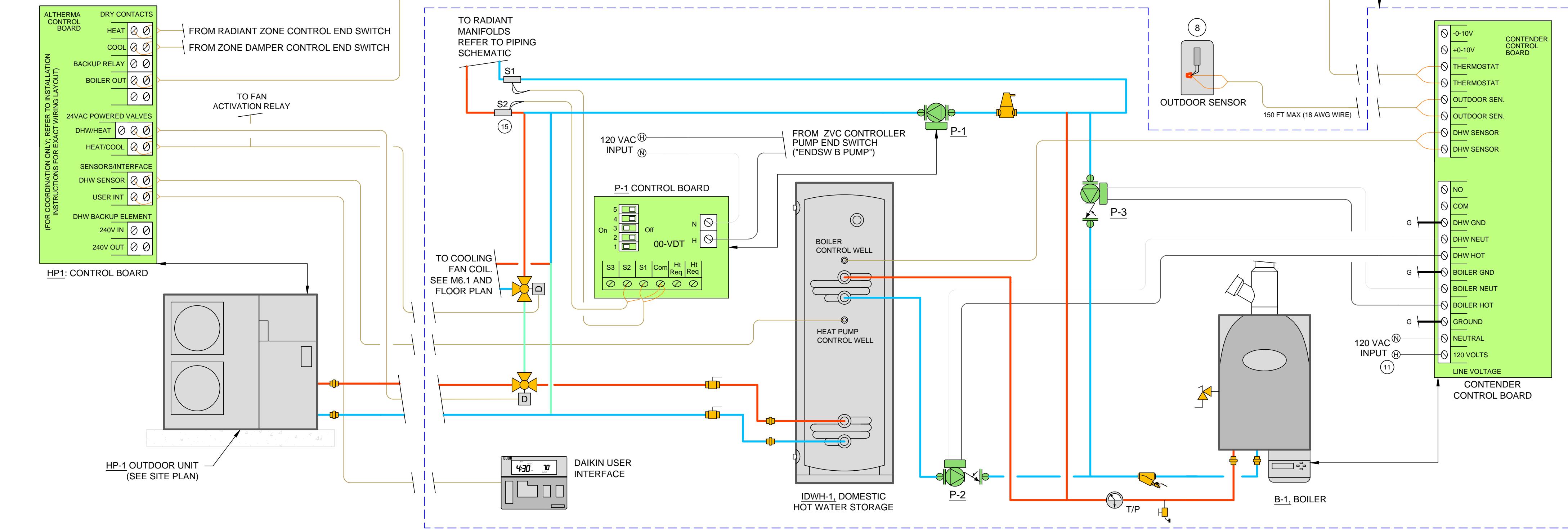


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1 TYPICAL WIRING EXAMPLE FOR ZONE CONTROLLERS*

NOT TO SCALE

*NOTE: THIS DETAIL IS A TYPICAL WIRING EXAMPLE AND DOES NOT REPRESENT THE EXACT WIRING CONFIGURATION PERTAINING TO THIS PROJECT. REFER TO M6.1 FOR EXACT ZONE CONTROLLERS, THERMOSTATS AND ZONING REQUIRED.



LEGEND

BALL VALVE	PRESSURE REDUCING VALVE
TEMPERATURE GAUGE	AIR VENT
T/P	STRAINER
TEMPERATURE/PRESSURE GAUGE	3-WAY MOTORIZED DIVERTING VALVE
UNION	AIR SEPARATOR
SUPPLY AND RETURN MANIFOLD	TERMOSTATIC MIXING VALVE
HOSE BIB/DRAIN/ PURGE VALVE	ESB ZONE VALVE
CHECK VALVE - SPRING	BACKFLOW PREVENTER
PUMP W/INTEGRAL FLOW CHECK	PUMP
PRESSURE RELIEF VALVE	4-WAY MOTORIZED MIXING VALVE
EXPANSION TANK	3-WAY MOTORIZED MIXING VALVE
24VAC TRANSFORMER (FIELD SUPPLY)	120 V
RELAY	18 GAUGE RELAY/ THERMOSTAT WIRE (2-8 CONDUCTOR)

2 HEATING SYSTEM CONTROL SCHEMATIC - CONTENDER BOILER AND SOLAR WITH IDWH

NOT TO SCALE

CONTROLS SCHEMATIC

DATE: 01/13/2014
 SCALE: AS NOTED
 DRAWN: MEG
 CHECKED:
 CHECKED:
 FILE NAME:
 SHEET: M6.2
 SHEET OF SHEETS